

Application No. 09/997,065
Response to Office Action

Customer No. 01933

Listing of Claims:

Claim 1 (Canceled).

2. (Currently Amended) The non-contact temperature measuring ~~apparatus~~ method according to claim ~~±~~ 5, wherein said coil and said thermosensitive element of the electronic circuit mounted on said each spherical semiconductor are disposed
5 diametrically opposite to each other.

3. (Currently Amended) The non-contact temperature measuring ~~apparatus~~ method according to claim ~~±~~ 5, wherein the measurement object ~~is~~ comprises a semiconductor wafer, and
wherein said thermosensitive element is embedded into a
5 surface layer of the semiconductor wafer.

4. (Currently Amended) The non-contact temperature measuring ~~apparatus~~ method according to claim ~~±~~ 5, wherein said memory of said each spherical semiconductor ~~is~~ comprises a nonvolatile memory that retains the identification information
5 even when the internal power is not present ~~disappears~~.

Application No. 09/997,065
Response to Office Action

Customer No. 01933

5. (Currently Amended) A non-contact temperature measuring method [[,]] for a non-contact temperature measuring apparatus,
wherein the non-contact temperature measuring apparatus
comprises:

5 spherical semiconductors mounted to a measurement
object, each spherical semiconductor including a surface which is
integratedly formed with an electronic circuit, and a coil
mounted thereon; and

10 a data collector, disposed out of contact with said
spherical semiconductors, for supplying said spherical
semiconductors with electric power required to operate each said
electronic circuit and for collecting pieces of temperature
information transmitted from said spherical semiconductors;

15 wherein said electronic circuit of each spherical
semiconductor comprises: (i) a memory for storing identification
information proper to the spherical semiconductor; (ii) a power
source section for generating internal power, required to operate
said electronic circuit, from electromagnetic energy received
through said coil from outside the spherical semiconductor;
20 (iii) a sensing circuit including a thermosensitive object; and
(iv) a transmitter for transmitting, as the temperature
information, an output of said sensing circuit through said coil
when the identification information stored in said memory is
specified by said data collector; and

Application No. 09/997,065
Response to Office Action

Customer No. 01933

25 wherein said data collector comprises (i) an energy
 source for generating the electromagnetic energy; (ii) a
 transmitter for transmitting identification information to
 specify an arbitrary one of said spherical semiconductors; and
 (iii) a receiver for detecting the temperature information
30 transmitted from the specified spherical semiconductor;
 said method comprising the steps of:
 (a) substantially uniformly distributing the spherical
 semiconductors ~~of the non-contact temperature measuring apparatus~~
 ~~as set forth in any one of claims 1-4 on a~~ the measurement
35 object;
 (b) simultaneously supplying the spherical semiconductors
 with electric power from the data collector ~~of said apparatus, so~~
 as to thereby permit power the spherical semiconductors to detect
 temperatures of different points on the measurement object;
40 (c) contactlessly collecting, by the data collector, pieces
 of temperature information indicative of the detected
 temperatures and which is transmitted from the spherical
 semiconductors; and
 (d) determining, by the data collector, at least one
45 of temperatures of the measurement object and or a temperature
 distribution throughout the measurement object based on the
 pieces of temperature information; ~~by the data collector~~

Application No. 09/997,065
Response to Office Action

Customer No. 01933

50 wherein the temperature information to be transmitted from
each spherical semiconductor is corrected in accordance with
temperature correction information determined for each spherical
semiconductor.

6. (Currently Amended) The non-contact temperature
measuring method according to claim 5, wherein ~~said step (a)~~
~~includes disposing the measurement object comprises a~~
~~semiconductor wafer, one of the spherical semiconductors is~~
5 provided at a center of a surface of ~~a~~ the semiconductor wafer,
~~and serving as the measurement object and disposing remaining~~
~~spherical semiconductors are distributed~~ at equal angular
intervals on a circumference of at least one imaginary circle
centered at the center of the surface of the semiconductor wafer,
10 and

~~said step (b) includes detecting wherein~~ surface
temperatures ~~of~~ are detected at different points on the
semiconductor wafer.

7. (Currently Amended) The non-contact temperature
measuring method according to claim 5, wherein ~~said step (c)~~
~~includes sequentially collecting~~ pieces of identification
information which are respectively proper to the spherical
5 ~~semiconductors , respectively, and each of which is~~ are

Application No. 09/997,065
Response to Office Action

Customer No. 01933

transmitted from a corresponding one of the spherical
semiconductors together with the temperature information and
sequentially collected by the data collector, and

~~said step (d) includes determining wherein~~ the temperature
10 distribution throughout the measurement object is determined in
accordance with the pieces of temperature information and the
pieces of identification information.

8. (Currently Amended) The non-contact temperature
measuring method according to claim 5, wherein ~~said step (c)~~
~~includes correcting the temperature information to be transmitted~~
~~from each spherical semiconductor in accordance with temperature~~
5 ~~correction information determined for each spherical~~
~~semiconductor~~, the temperature correction information being is
determined ~~from the~~ based on an output of the sensing circuit of
the spherical semiconductor ~~in a condition that~~ when the
measurement object mounted with the spherical semiconductors is
10 placed in a predetermined temperature ~~circumstance~~ environment.